

**PROPOSAL FOR
CONFIRMATORY SAMPLING NO FURTHER ACTION
ENVIRONMENTAL RESTORATION SITE, 192
OPERABLE UNIT 1302**

Prepared by
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Prepared for the
U. S. Department of Energy

PROPOSAL FOR CONFIRMATORY SAMPLING NO FURTHER ACTION

ENVIRONMENTAL RESTORATION SITE 192, TA-I WASTE OIL TANK

OPERABLE UNIT 1302

1. INTRODUCTION

Sandia National Laboratories/New Mexico (SNL/NM) is proposing a No Further Action (NFA) decision for Environmental Restoration (ER) Site 192 based on confirmatory sampling NFA Criterion 3 (NMED et al. 1995).

1.1. ER Site Identification Number and Name

ER Site 192 (herein referred to as the site) is the TA-I Waste Oil Tank, and is included in Operable Unit 1302. This site had several aliases:

- The RFA Report designated it as SWMU 77: Blue Oil Tank (EPA 1987).
- A July 1991 memo called it ER Site 187 (Gaither 1991).
- A 1992 memo says it was listed in the RFA report as SWMU #80 (Garcia 1992).
- The 1992 memo then went on to change the ER designation to ER Site 192 (Garcia 1992).

It is not clear why there was confusion over the RFA Report SWMU number. The ER site number changed because ER Site 187 had previously been assigned to the TA-I Sanitary Sewer Lines and the same number was inadvertently used to describe the Waste Oil Tank in the 1991 memo by Gaither (Garcia 1992).

1.2. SNL/NM NFA Process

The basis for proposing an NFA with confirmatory sampling is thoroughly described in Section 4.5.3 of the Draft *Program Implementation Plan (PIP) for Albuquerque Potential Release Sites* (SNL/NM 1994) and in Annex B of the *Environmental Restoration Document of Understanding* (NMED et al. 1995). Briefly stated, if contaminant levels at the site do not exceed regulatory or risk-based criteria, the site can be proposed to the appropriate regulatory agency for NFA. This meets the NFA Criterion 3 (no release to the environment has occurred) described in Annex B of the Document of Understanding (EPA 1995).

As determined by the sampling activities described in this proposal, ER Site 192 has not released hazardous waste or constituents into the environment.

1.3. Local Setting

The site, with an area of 0.2 acre, is located on the northwest corner of H and 20th Streets (Figure 1; Appendix A). Presently, the site contains a concrete slab and curb (described below); the surrounding soil has no vegetation. It appears that little activity occurs at the site, which is outside the fenced area of TA-I and is, therefore, accessible to anyone with access to the base.

2. HISTORY OF THE SWMU

2.1. Sources of Supporting Information

Information regarding the site can be found in the following pertinent documents:

- *Final RCRA Facilities Assessment Report of Solid Waste Management Units at Sandia National Laboratories, Albuquerque, New Mexico* (EPA 1987).
- *New ER Site #187, TA-I Waste Oil Tank*. [Sandia National Laboratories memorandum to P. Davis, July 19, 1991] (Gaither 1991).
- *Changes to ER Program Site List*. [Sandia National Laboratories memorandum to W. Cox, June 24, 1992] (Garcia 1992).
- *Hazardous and Solid Waste Amendments Permit for Sandia National Laboratories, EPA I.D. No. NM 5890110518* (EPA 1993).
- *Program Implementation Plan for Albuquerque Potential Release Sites [DRAFT]* (SNL/NM 1994).
- *Technical Area I (ADS 1302) RCRA Facility Investigation Work Plan* (SNL/NM 1995).

2.2. Previous Audits, Inspections, and Findings

The site was first listed as a potential SWMU by the *Final RCRA Facilities Assessment (RFA) Report of Solid Waste Management Units at Sandia National Laboratories, Albuquerque, New Mexico* (EPA 1987). The RFA noted that during a site inspection, "...evidence of spills on the sides of the tank were noted. Small spills were also observed in the containment area. It was not clear if releases occurred outside the berm." The RFA went on to conclude that there was a high potential for a release to the air, a moderate potential for a release to soils, a low potential for a release to surface water and groundwater, and no potential for a release to subsurface gas (EPA 1987).

2.3. Historical Operations

In 1980, a 500-gal steel aboveground tank was installed on a 4-ft by 13-ft by 4-in. bermed, concrete slab; it was used to collect employee waste motor oil for recycling (SNL/NM 1995). A conflicting report states that when the tank was first erected, it sat on bare ground and the bermed concrete pad was installed in 1986 or 1987 (Gaither 1991). All historical photographs of the site show the tank placed on the concrete pad. A 1.5-in drain pipe extended from the center of the concrete curb on the west side of the slab. Photographs taken during the RFA (Smith 1987) indicate wooden stairs which led up to the opening in the center of the tank; a funnel was placed in the opening to allow employees to pour oil into the tank.

The Motor Pool was responsible for the tank. Employees who had access to KAFB had around-the-clock access to the oil tank. Waste oil dumping in the tank was not monitored, which resulted in overflows when the tank became full (Gaither 1991). The tank was emptied monthly by a subcontractor (Mesa Oil), and employees from the Motor Pool would periodically steam-clean the exterior of the tank to remove oil that had spilled or dripped. Occasionally cartons and other containers of oil and car batteries were left on the ground near the tank (Gaither 1991). Photographs taken during the RFA investigation showed staining on the tank sides (EPA 1987; Smith 1987). In addition, the soil around the tank was stained with oil (Gaither 1991). Other than oil stains on the tank exterior and ground surface, no other spills are documented (DOE 1985). In 1989 the 500-gal steel tank was removed (Gaither 1991); the concrete slab and curb were left in place.

3. EVALUATION OF RELEVANT EVIDENCE

3.1. Unit Characteristics

The unit consisted of a 500-gal steel aboveground tank placed on a 4-ft by 13-ft by 4-in. bermed, concrete slab as a form of secondary containment.

3.2. Operating Practices

The tank was emptied monthly by a subcontractor (Mesa Oil), and employees from the Motor Pool would periodically steam-clean the exterior of the tank to remove oil that had spilled or dripped. No written procedures for operating the site are known.

3.3. Presence or Absence of Visual Evidence

In 1991, the soil around the tank was described to have been "stained with oil" (Gaither 1991). In contrast, field personnel conducting site visits and sampling activities in 1995 were unable to find any oil-stained soils (Appendix B; borehole logs)

3.4. Results of Previous Sampling/Surveys

Prior to the RFI, no sampling or analysis of soil surrounding the concrete berm had been conducted at this site. No historical data were found which related to the nature and extent of contamination. During the time between producing the initial draft of the Work Plan and conducting the field work for the RFI, a PETREX passive soil gas survey was conducted at the site using excess soil gas samplers that were available from another investigation at SNL/NM. The results of this "no-cost" survey were used to further determine the extent and nature of contamination at the site.

The PETREX soil gas collectors consist of activated charcoal adsorption elements in an inert atmosphere contained by a resealable glass tube. The opened collectors were installed 18 inches bgs and exposed for approximately 3 weeks. The sampler exposure time was determined to be 2 to 3 weeks by use of exposure time test samplers (time tests) at other SNL/NM locations (NERI 1994). The response values (analytical results) are reported in ion counts. Ion count values are the unit of measure the relative intensities associated with each of the reported compounds. For Site #192 the ion count values were not represented to an actual concentration of the reported compounds. Therefore, these values are best used as a semi-quantitative measure where a change in ion count value of an order of magnitude is considered significant for distinguishing potential hot spots from background areas (NERI 1994).

At the site, four collectors were installed around the bermed, concrete pad that held the former waste oil tank. The locations were from 0.5 to 11 ft away from the concrete pad on the north, east, south, and west sides of the pad (Figure 2). The collectors were installed by IT Corporation on April 27, 1994, using a bucket-style hand auger. After the collectors were placed, the holes were backfilled with native soils, flagged, and the locations measured from the corners of the concrete pad (IT Corp. 1994).

The collectors were removed on May 20, 1994, and sent to NERI's analytical laboratory in Lakewood, Colorado, for volatile organic compound (VOC) and semivolatile organic compound (SVOC) analyses (by thermal desorption--mass spectrometry or thermal desorption-gas chromatography/mass spectrometry). The analytical results for these four samples showed background ion count values for

Samples -001 through -003. Sample -004 had elevated (one order of magnitude) ion count values for tetrachloroethene and chlorobenzene (IT Corp. 1994). These VOC ion count values are comparable to results seen in other SNL/NM PETREX soil gas surveys where the levels detected were generally considered to be low and may not indicate environmentally significant concentration levels in the subsurface (NERI 1994).

3.5. Assessment of Gaps in Information

The PETREX sampling only looked for vapor phase contamination; no sampling or analysis of soil surrounding the concrete berm had been conducted at this site. The RFI sampling strategy (Appendix C) was designed to fully characterize the site.

3.6. Confirmatory Sampling

3.6.1. Sampling Strategy

The RFI sampling and analysis plan for the site is provided in Appendix C. The RFI field sampling started on May 30 and was completed on June 1, 1995. Soil samples were collected from eight separate locations (BH001 to BH008; Figure 3; Appendix A) within the site to a depth of 10 feet (ft) below ground surface (bgs). Soil samples were collected at 0 to 2 ft, 3 to 5 ft, and 8 to 10 ft bgs for a total of 24 samples. Field screening for total petroleum hydrocarbons (TPH) was performed at all locations. Additionally, confirmatory samples were analyzed for VOCs and TPH by onsite and offsite laboratories. The VOC analysis was performed to quantify specific TPH compounds that may be present at the site. The screening used immunoassay-based test kits. The total number of samples collected included 24 for onsite analysis, five for offsite analysis, and 24 for immunoassay field screening. These totals do not include quality assurance (QA)/quality control (QC) or waste management samples.

Equipment for all sampling at the site included 3-inch stainless-steel bucket augers with T-bar handles and extensions, stainless steel bowls and hand scoops, a thin-walled stainless-steel sampler and stainless-steel sleeves (used with hand auger), nitrile gloves, work gloves, a pick-ax, a shovel, miscellaneous tools, and decontamination equipment (brushes, plastic containers). Sampling equipment (such as hand augers, stainless steel bowls, and scoops) was decontaminated between each sample location and sample depth. All decontamination fluids were handled as waste.

The site was first field screened for possible radioactive contamination at each sample location using a micro-R-meter. Only background radiation levels were encountered. A photoionization detector (PID) was used to screen for organic vapors in the breathing zone and downhole at all sample locations. The PID readings were background for all locations (Appendix B)

Locations were chosen along the four compass points at approximately 2 and 10 to 14 ft out from the center line of the concrete pad/berm that was used to support the former waste oil tank. Individual soil samples for VOC and TPH analyses for the onsite laboratory were collected using a hand auger equipped with a thin-walled sampler and stainless-steel sleeve. For the offsite laboratory, the soil sample for TPH analysis was collected by hand scoop or auger, depending on depth, and then placed in an appropriate sample jar. The samples for immunoassay field screening were collected in the same manner, then placed into 250-ml wide-mouth jars, and hand-delivered to the Environmental Restoration Field Office (ERFO) laboratory for immediate analysis.

A total of three samples from each borehole were sent to the onsite laboratory. For every five samples sent to the onsite laboratory, one sample was sent to an offsite laboratory for confirmatory analysis. The soil collected was generally very uniform, consisting predominantly of fine to silty sand with varying proportions of medium to coarse sand and fine gravel. A gravelly layer, 0.5 to 1 ft thick, was present at a depth of 2.5 to 3 ft bgs in some boreholes. The lithology of the coarse fraction mainly consisted of limestone, granite, and various metamorphic rock types. Soil color (by Munsell^R rock-color chart) varied from moderate yellowish brown (10 YR 5/4) near the surface through very pale orange (10 YR 8/2) to grayish orange (10 YR 7/4) and light brown (5 YR 6/4 and 5 YR 5/6) at 3 to 5 ft. This color usually continued to depth (10 ft). Surface staining was not evident at the site. The borehole logs in Attachment B contain more detailed lithologic descriptions.

Sample points were located by measuring the distance of the borehole from the concrete pad/berm. Measurements were taken to the nearest tenth of a foot; distances were hand-plotted on a site map and the coordinates entered into the ER Geographic Information System database (Table 1; Appendix D).

QA/QC samples collected at the site included field duplicates, field blanks, rinsate blanks, and trip blanks. Field duplicates, field blanks, and rinsate blanks were collected at a rate of 5 percent of the number of environmental samples sent for offsite analysis. A total of one each for duplicate, field blanks, and rinsate blanks were collected for this RFI. Trip blanks accompanied all offsite shipment of

VOC samples, for a total of four trip blanks. Matrix spike (MS) and matrix spike duplicates (MSDs) were done at the laboratory using excess soil from the environmental samples.

The field duplicates were collected as a split sample from the composite bowl for the TPH analysis. The VOC duplicate samples were collected by using two stainless-steel sleeves in the thin-walled sampler. The sampler collected soil samples immediately adjacent (beneath) one another. The rinsate samples were collected by passing deionized water over decontaminated equipment. The field blanks were glass jars filled with clean soil that were exposed to the atmosphere in the vicinity of the work area. The trip blanks were sealed jars of clean soil or water that were placed in sample coolers sent to the laboratories. The Sample Management Office (SMO) supplied both the field blank and trip blank soils and jars; the offsite laboratory supplied the aqueous trip blanks.

All offsite analytical sample information was handled by the SMO after the field team relinquished custody of the samples to the SMO. When the samples were shipped to the analytical laboratory, the SMO entered sample information into a database and tracked the status of the analytical results. When data became available, the SMO received the results with a summary data report and laboratory quality control sample.

The SMO reviewed the data summary reports and field collection documentation for completeness and accuracy as required by SNL/NM TOP94-03. SMO personnel performed level 1 and 2 data validations (DV1/DV2) on all data packages received from the laboratory. DV1 included reviewing the data package completeness, making sure that all requested analyses were performed and that all reports were signed by laboratory managers. DV2 included reviewing holding times and laboratory QC samples (method blanks, surrogate recovery samples, MS/MSDs, and laboratory control samples), comparing reported detection limits to contract required detection limits, and making sure the case narrative was correct and complete. The SMO was responsible for submitting all parts of the data packages to the Environmental Operations Record Center. This submittal included the original field collection and custody documentation, the laboratory data report, and DV1/DV2 review documentation. Also, the analytical laboratories submitted analytical data in an electronic format for loading into the ER data management system (ERDMS). All geochemical analytical data tables presented in this report were generated by the ERDMS.

Onsite VOC, TPH, and TPH immunoassay data were managed by the ERFO laboratory.

3.6.2. Analytical Results

All soil samples collected (from three separate depths at eight locations for a total of 24) at the site were analyzed using U.S. Environmental Protection Agency (EPA)-approved methods for VOCs (EPA 8240/8260). All soil samples (BH001 to BH008) were field screened for TPH by the ERFO onsite laboratory using TPH immunoassay analysis kits by EnSys, Inc., called PETRO RISC®. Five confirmatory samples were sent offsite to be analyzed for VOCs (EPA 8240/8260) and TPH (EPA 8015).

The immunoassay analysis technique relies on an antibody that is developed specifically to be sensitive to the target compound. The antibodies in the PETRO RISC® test kit are sensitive to gasoline, diesel, jet fuel, or used lubrication oils, but are not sensitive to potential interference compounds such as chlorinated solvents. The antibody's specificity triggers a sensitive colorometric reaction, providing a visual interpretation of the result.

The immunoassay analysis itself is a four-step process that includes sample extraction, sample preparation, sample incubation, and interpretation of the result. Total run time is approximately 25 minutes per analysis, and several samples can be run at once. The results are determined by comparing the sample color to the color in a standard using a photometer supplied by EnSys, Inc. EPA has approved the PETRO RISC® test kits for inclusion in the third update of Test Methods for Solid Waste, SW-846, under EPA Draft Method 4030. The detection limits vary from 10 to 130 parts per million (ppm), depending on the analyte in question. The manufacturer states that this test method has a detection level of 50 ppm when used to detect used lubrication oils such as the motor oil spilled at the site (Kottenstette 1995). According to the manufacturer's product information sheet, the test method has a less than 1% occurrence rate of false negative results (i.e. the test reports a sample is "clean" when it actually "dirty"). However, in order to achieve this low occurrence rate for false negatives, the test method has a relatively high occurrence rate of false positives (i.e. the test reports a sample is "dirty" when it is actually "clean"). The occurrence rate for false positives is reported to be less than 11%, which implies that as many as one in ten positive results is false.

Of the 24 TPH immunoassay analyses performed at the site, two showed positive hits at greater than 50 ppm. The two positive hits were found in samples from locations BH001 at 8 to 10 ft, and BH006 at 0 to 2 ft (Table 2; Appendix D). All other TPH immunoassay analyses resulted in nondetects.

The ERFO laboratory performed VOC (EPA 8240/8260) analysis on all 24 soil samples collected. All analytes for all samples were nondetects except one hit of acetone at 15 parts per billion (ppb) (J value) for BH002 at 0 to 2 ft (Table 3; Appendix D).

Five soil samples were sent to an outside laboratory for independent analysis for VOC (EPA 8240) and TPH (EPA 8015). All results were nondetect (< 100 ug/Kg) for TPH (Table 4; Appendix D). However, as discussed in the narrative report, soil samples from BH004 (0 to 2 ft), and BH007 (0 to 2 ft) were reported to "contain[s] hydrocarbons which are heavier than diesel." No quantified amount was reported by the laboratory. For VOC analysis, all analytes for all samples were nondetects except for hits of acetone (282 ppb, J value) and benzene (115 ppb, J value) in the sample from location BH004 at 0 to 2 ft (Table 4; Appendix D).

For trip blanks TB001 and TB002 and for field blank FB001, the laboratory reported all nondetects for the VOC analyses (Table 3; Appendix D). Trip blank TB003, associated with equipment blank EB001, did have hits on 2-butanone, methylene chloride, and toluene. The equipment blank also had hits on acetone and methylene chloride. The methylene chloride hit in the equipment blank is most likely a nondetect because methylene chloride is also reported in the associated trip blank, and the reported equipment blank value is less than 10 times the reported value in the trip blank (EPA 1988). Duplicate samples were collected at the 2 ft depth at location BH008, and sent offsite for TPH and VOC analysis. All results from the duplicates were nondetect.

3.7. Risk Evaluation

The purpose of this evaluation is to provide an ecological evaluation of the potential contaminants of concern associated with the TA-I Waste Oil Tank, Site 192. Site 192 is an area of 0.2 acre, located on the northwest corner of H and 20th Street. This site is located outside of TA-I. Presently the site is covered with a concrete slab and bordered by a curb. A 500-gal. steel aboveground tank was installed on the 4-ft by 13-ft concrete slab that was used to collect employee waste oil for recycling.

Sampling was conducted that showed the soils to be free of VOCs and TPH. Acetone concentrations were detected in some samples that is contributed to laboratory contamination and not to the site. The data show that the site does not contain contaminants of concern.

Due to the lack of contamination at this site, no further ecological evaluation is necessary. The site does not present a danger to ecological species and should be considered for no further action.

3.8. Rationale for Pursuing a Confirmatory Sampling NFA Decision

3.8.1. Evaluation of Concentrations

Overall, the data show that the soils at the site are free of VOCs and TPH. The acetone concentrations seen in the samples analyzed by both the onsite and offsite laboratories represent laboratory contaminants. Acetone is a common laboratory contaminant and is not a contaminant of concern at this site. The low-level concentration (by offsite analysis) of benzene in the 2 ft sample at BH004 is potentially a legitimate occurrence. The split sample from the same interval analyzed by the onsite laboratory did not have detectable concentrations of benzene or any other VOCs. However, assuming the detected benzene concentration is a real value, it is two orders of magnitude less than the Proposed Subpart S action level for soils of 20,000 ppb. Therefore, due to the low concentration, singular occurrence, and questionable validity of the benzene detect, benzene is not considered a contaminant at the site.

The TPH immunoassay data suggest that two samples had TPH concentrations greater than 50 ppm. These two values are thought to represent false positives for the following reasons: 1) The manufacturer's product information sheet states that a false positive can be expected at an occurrence rate >10%. At the site, the test kits had two positive results out of twenty four analyses, for an occurrence rate of approximately 8% of the analyses. 2) The onsite laboratory VOC analyses were nondetect for the same sample locations and depths. 3) The offsite laboratory TPH analysis were nondetect for all sample locations and depths. 4) The indication of TPH contamination at the 10 ft depth at location BH001 is at a level below 2 clean samples (nondetects) at the 2 ft and 5 ft depths. It would be difficult for TPH to contaminate soils at 10 ft bgs without having contaminated the upper 5 ft of soil.

As stated above, the offsite TPH analysis were all nondetects. The labs did go on to report that their instruments tentatively detected petroleum product outside the calibration range of the instrument, listed simply as "hydrocarbons heavier than diesel". This suggests that trace amounts of possibly used motor

oil may be present. However, based on all other analytical results and the visual descriptions presented in the borehole logs, gross contamination by motor oil is not present at the site.

3.8.2. Data Summary and Recommendations

The site has been sufficiently characterized by sampling 8 locations (over an area measuring 50 ft by 40 ft) with samples collected at three depths down to 10 ft. The data show that the site does not contain any significant levels of contaminants of concern. A revised conceptual model for the site consists of possible low levels of motor oil-contaminated near surface soils. If there is motor oil in the soils at the site, it would be similar to what might be found in an unpaved parking lot with minor releases ("grease spots") formed by motor oil dripping from car-engine crankcases. This site is also located in an industrial area and no ecological risk assessment is warranted. NFA is recommended for this site, based on the following:

- No VOCs were detected by the onsite laboratory.
- No significant concentrations of VOCs were detected by the offsite laboratory. The few VOCs that were detected can be attributed to laboratory contamination, or soil contamination well below Proposed Subpart-S action levels.
- No TPH was detected by the offsite laboratory.
- No TPH was detected by field screening immunoassay methods other than two detects which are interpreted to represent "false-positive" results.
- No visibly contaminated soils were described in the borehole logs.
- No VOCs were detected by PID field screening.
- No VOC concentrations indicative of contamination were detected during the passive soil gas survey.

Based on the site history and the data collected during this RFI sampling program, ER Site 192 has not released hazardous waste or constituents into the environment. Therefore, further investigations and/or VCMs are not warranted. Upon acceptance of the NFA proposal, the site will be permanently removed from the list of ER Sites in the Hazardous and Solid Waste Amendments module of the RCRA Part B Permit (EPA 1992).

4. CONCLUSION

Based upon the evidence cited above, no potential remains for a release of hazardous waste (including hazardous constituents) which may pose a threat to human health or the environment. Therefore, ER Site 192 is recommended for an NFA determination.

5. REFERENCES

5.1. ER Site References

Gaither, K., 1991. New ER Site #187, TA-I Waste Oil Tank. Sandia National Laboratories memorandum to P. Davis, July 19, 1991.

Garcia, D., 1992. Changes to ER Program Site List. Sandia National Laboratories memorandum to W. Cox, June 24, 1992.

IT Corp., 1994. Field and Laboratory Documentation for TA-1 Soil-Vapor Survey. Letter Report from Thomas Woodard (IT Corp.) to David Miller (SNL/NM, Department 7582), July 8, 1994.

Kottenstette, R. J., 1995. SNL/NM (Department 7584) Memo to David Miller (SNL/NM Department 7582). Subject: Immunoassay test for Site 192/ADS 1302. July 12, 1995.

Lewis, P., 1995. SNL/NM (Department 7584) Memo to David Miller (SNL/NM Department 7582). Subject: 8260 Analytical Results (Site 192, ADS 1302). June 12, 1995.

NERI, 1994. Northeast Research Institute. Draft Report on the PETREX Soil Gas Survey Conducted by IT Corporation at Technical Area II, Sandia National Laboratories, located in Albuquerque, New Mexico. NERI, Lakewood, Colorado. January 4, 1994.

Smith, G.J., 1987. Transmittal of Pictures Taken by SNLA for EPA Contractor during RCRA Facility Assessment. Memorandum to L. Dalton (DOE/AL-MSD), February 4, 1987.

SNL/NM (Sandia National Laboratories, New Mexico), 1995 *Technical Area I (ADS 1302) RCRA Facility Investigation Work Plan*. Environmental Restoration Program, Sandia National Laboratories, U.S. Department of Energy, Albuquerque Operations Office, February 1995., [Includes: Interview notes and records of telephone conversations with current and retired SNL/NM employees (Employees 1 through 51). Communication made from February through June, 1993, as part of ER Program background investigation of TA-I ER Sites. SNL/NM Environmental Operations Record Center maintains these personal communication notes as a controlled document.]

5.2. Reference Documents

DOE, 1985. Interviews with current and retired Sandia Corporation personnel, conducted September and October 1985 by personnel from Los Alamos National Laboratory. As cited in DOE 1987,

Comprehensive Environmental Assessment and Response Program (CEARP), Phase I: Installation Assessment, Sandia National Laboratories, Albuquerque, New Mexico [DRAFT]. September 1987.

EPA (U.S. Environmental Protection Agency), 1987. *Final RCRA Facilities Assessment Report of Solid Waste Management Units at Sandia National Laboratories, Albuquerque, New Mexico.* Prepared by A.T. Kearney, Inc., and Harding Lawson Associates under Contract No. 68-01-7038, April 1987.

EPA (U.S. Environmental Protection Agency), 1988. Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses. Prepared for the Hazardous Site Evaluation Division of the U.S. Environmental Protection Agency. February 1, 1988.

EPA (U.S. Environmental Protection Agency), 1992. Module IV of RCRA Permit No. NM 5890110518, EPA Region VI, U.S. Environmental Protection Agency. Issued to Sandia National Laboratories, Albuquerque, New Mexico, September 1992.

NMED (New Mexico Environment Department), 1995. *Environmental Restoration Document of Understanding.* New Mexico Environment Department, U.S. Environmental Protection Agency, U.S. Department of Energy, Los Alamos National Laboratory, and Sandia National Laboratory, November 16, 1995.

SNL/NM (Sandia National Laboratories, New Mexico), 1994. *Program Implementation Plan for Albuquerque Potential Release Sites [DRAFT].* Environmental Restoration Program, Sandia National Laboratories, U.S. Department of Energy, Albuquerque Operations Office, September 1993.

5.3. Aerial Photographs

No specific aerial photographs were used to support this NFA.

APPENDICES

- Appendix A ER Site 192 Figures
- Appendix B RFI Sampling Borehole Logs
- Appendix C Section 5.8 of the TA-I RFI Work Plan (SNL/NM 1995)
- Appendix D ER Site 192 Tables

Appendix A
ER Site 192 Figures

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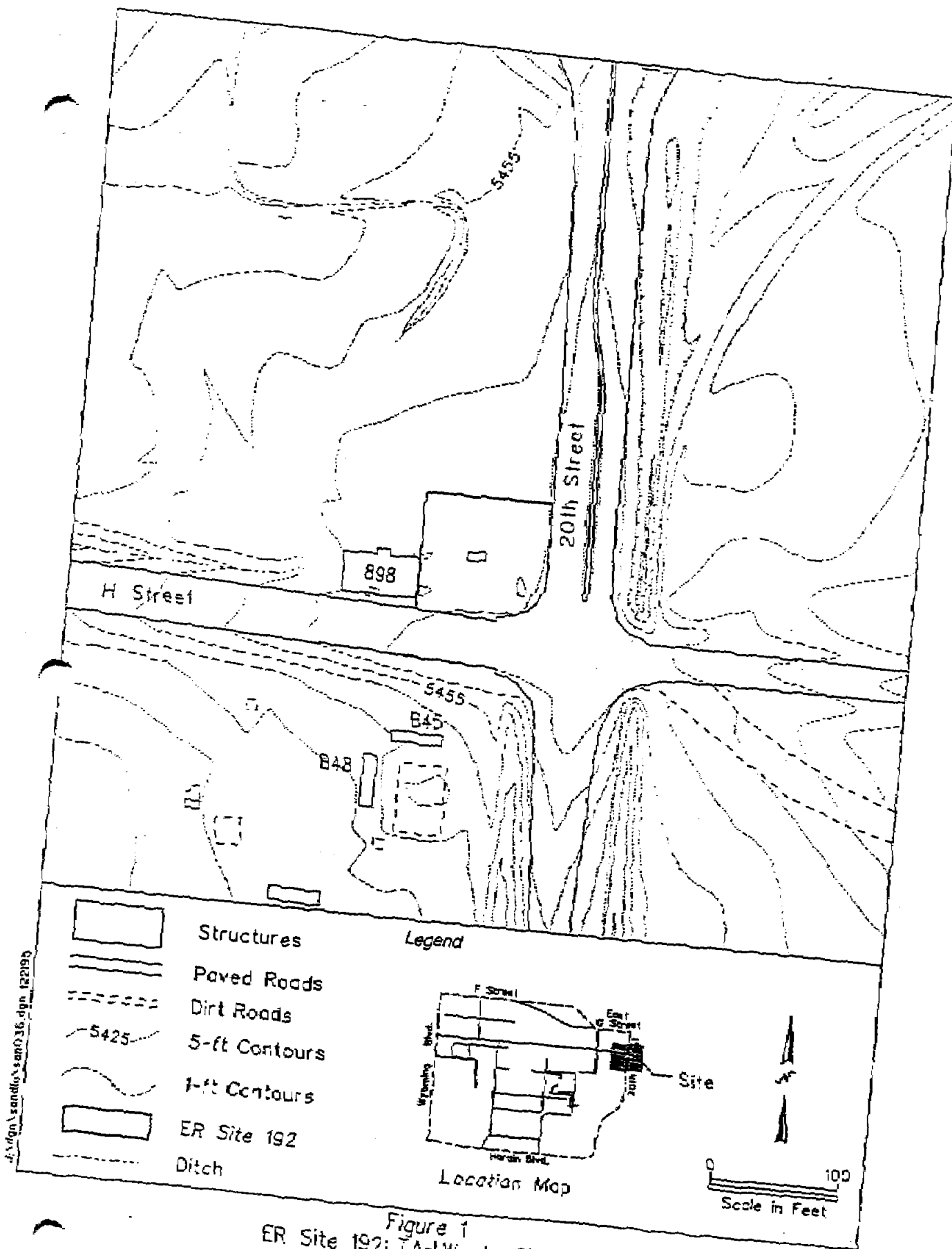


Figure 1
ER Site 192: TA-1 Waste Oil Tank

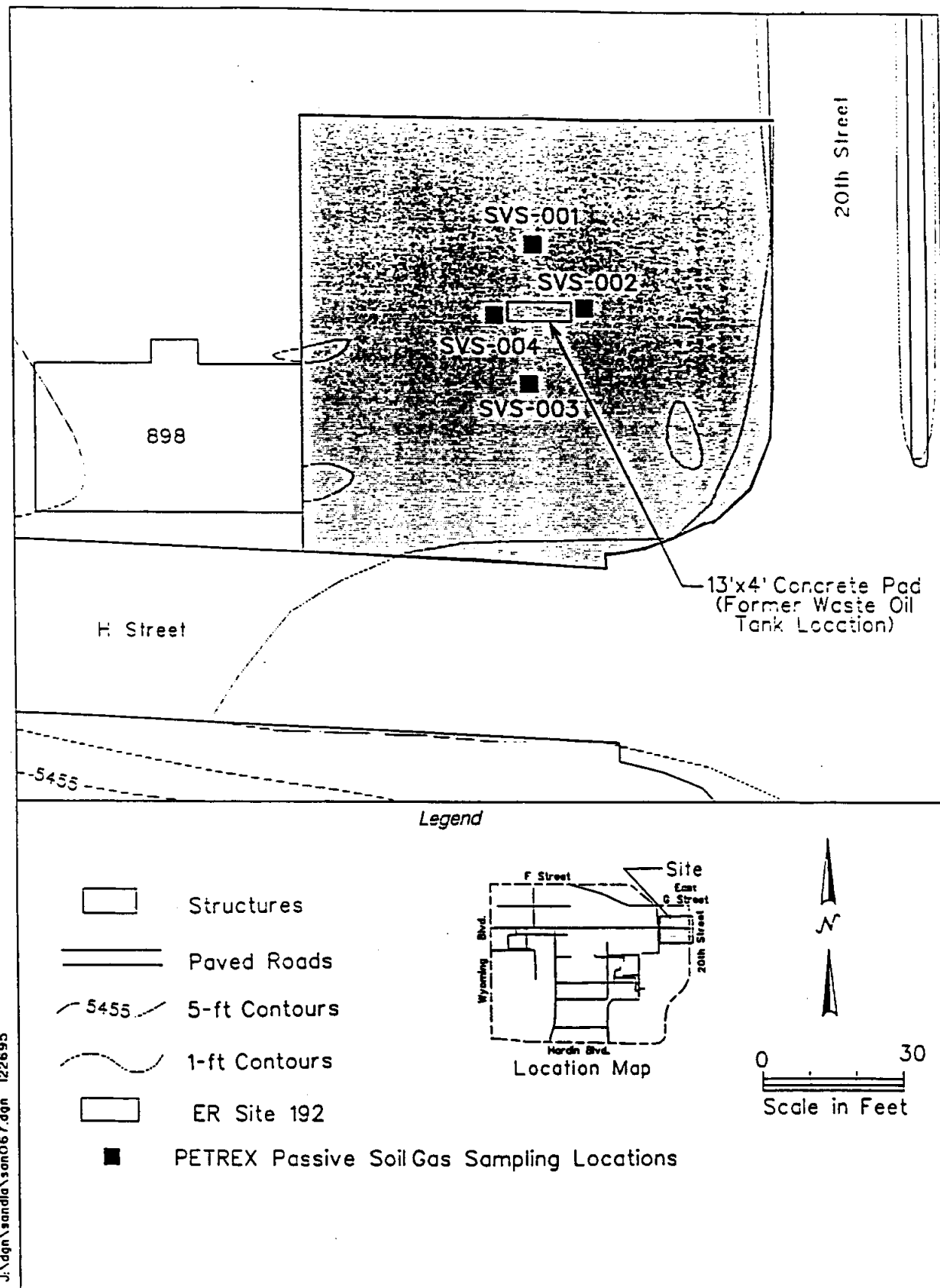
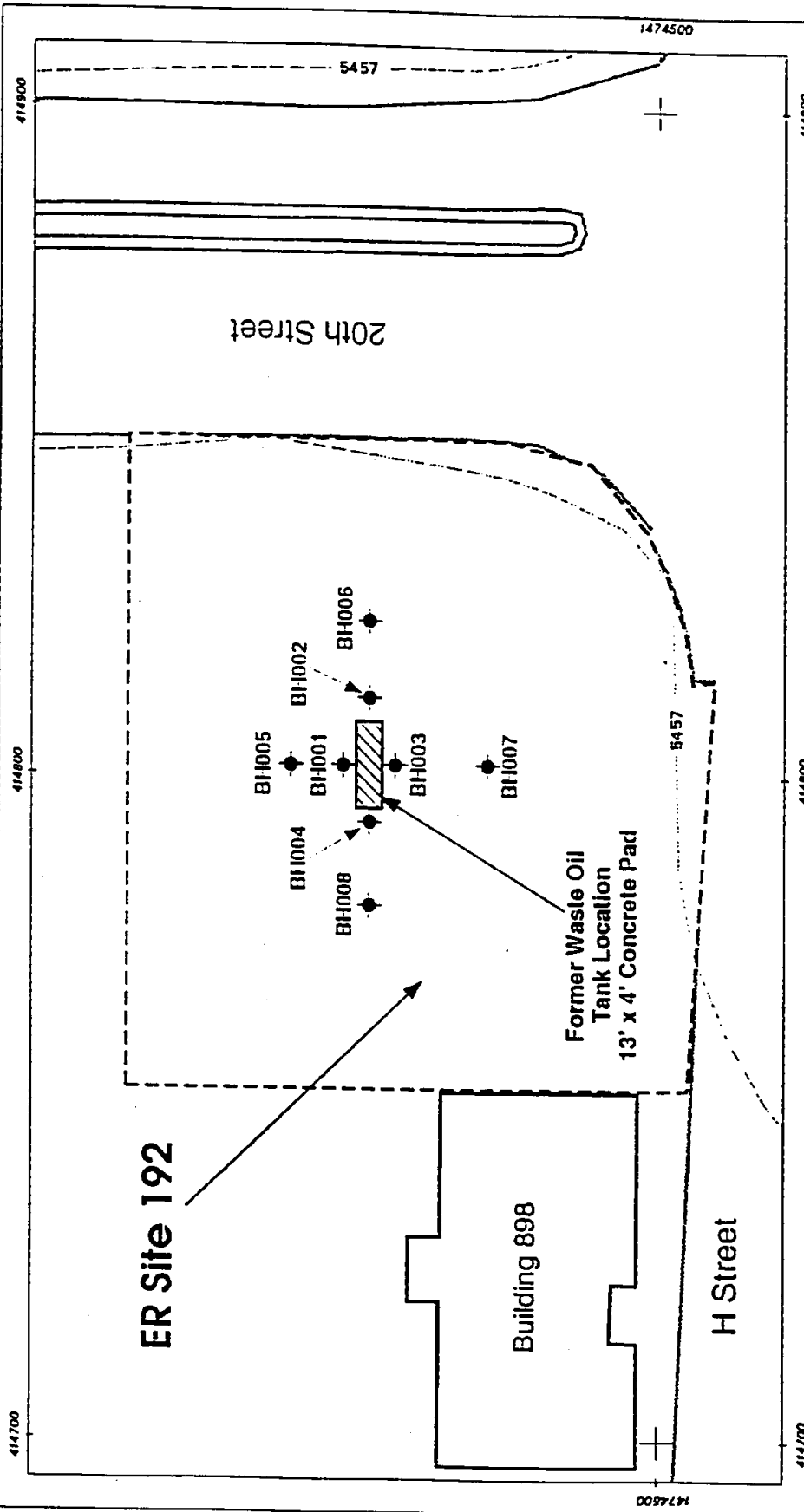


Figure 2
ER Site 192: PETREX Passive Soil Gas Sampling Locations

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Legend

- Geoprobe and Surface Soil Sampling Locations
- Buildings
- Roadways
- One Foot Contours

- Concrete Pad
- ER Site 192

Sandia National Laboratories, New Mexico
Environmental Restoration Geographic Information System

Figure 3

ER Site 192: Surface and Near-Surface Soil Sampling Locations

0 12.5 25

Scale in Feet

0 3 6

Scale in Meters



Appendix C

Section 5.8 of the TA-I RFI Work Plan (SNL/NM 1995)

5.8 ER Site 192, TA-I Waste Oil Tank

5.8.1 Site Description and History

ER Site 192 is a 0.2-acre site located east of Building 898 on the northwest corner of H and 20th Streets (Figure 5-26). This site had several aliases:

- The RFA Report designated it as SWMU 77: Blue Oil Tank (EPA 1987a).
- A July 1991 memo called it ER Site 187 (Gaither 1991 d).
- A 1992 memo says it was listed in the RFA report as SWMU #80 (Garcia 1992).
- A third memo corrected the designation to ER Site 192 (Garcia 1992).

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The Motor Pool was responsible for the tank. Employees who had access to KAFB had around-the-clock access to the oil tank. Waste oil dumping in the tank was not monitored, which resulted in overflows when the tank became full (Gaither 1991d). The tank was emptied monthly by a subcontractor (Mesa Oil), and employees from the Motor Pool would periodically steam-clean the exterior of the tank to remove oil that had spilled or dripped. Occasionally cartons and other containers of oil and car batteries were left on the ground near the tank (Gaither 1991d). Photographs taken during the RFA investigation showed staining on the tank sides (EPA 1987a; Smith 1987). In addition, the soil around the tank was stained with oil (Gaither 1991d). Other than oil stains on the tank exterior and ground surface, no other spills are documented (DOE 1985).

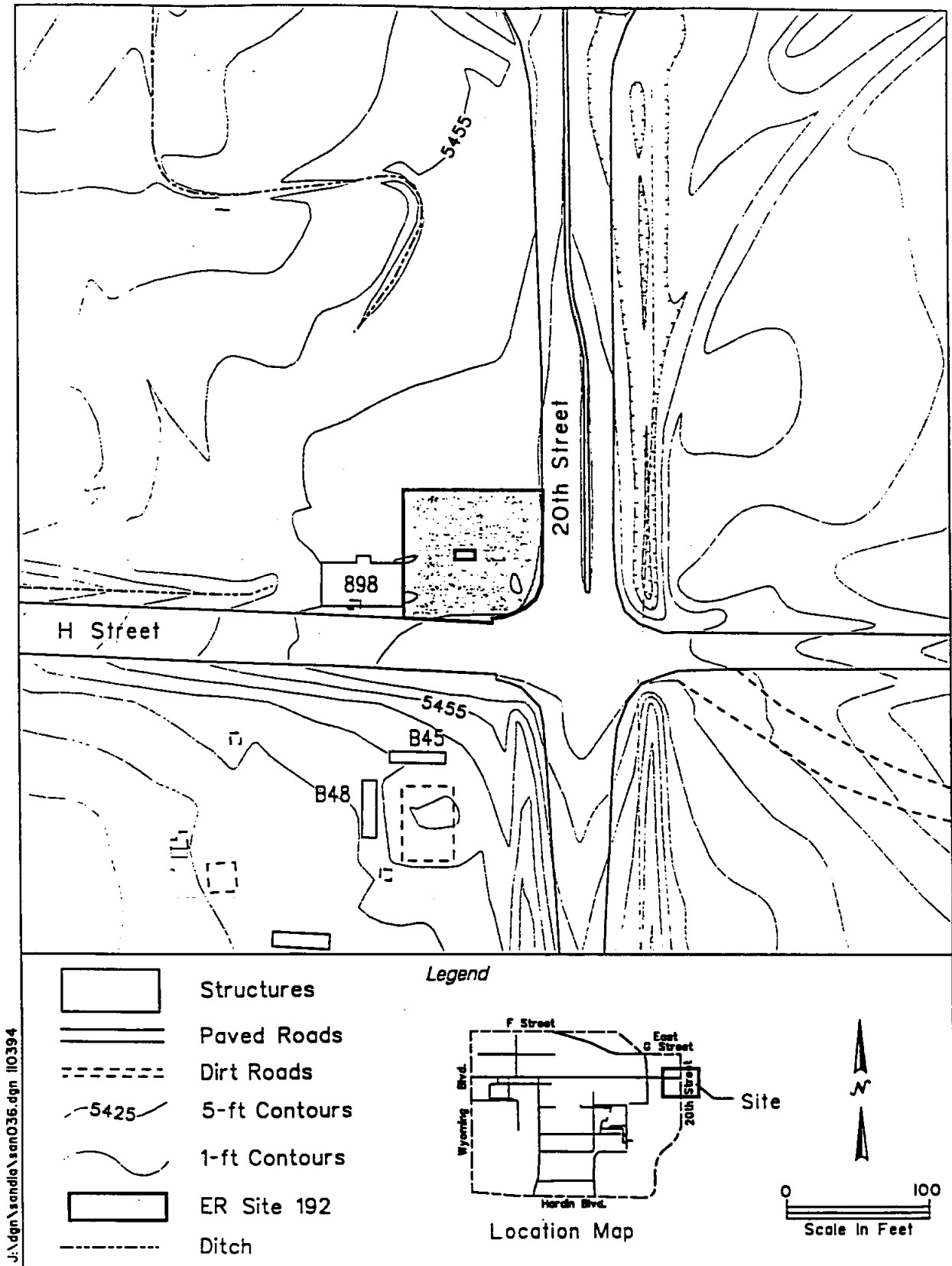


Figure 5-26
ER Site 192: TA-I Waste Oil Tank

In 1989 the 500-gal steel tank was removed (Gaither 1991d); the concrete slab and curb were left in place. Presently, the site contains the concrete slab and curb, and the surrounding soil has no vegetation. It appears that little activity occurs at the site, which is outside the fenced area of TA-I and is, therefore, accessible to anyone with access to the base.

5.8.2 Previous Investigations

To date, no sampling or analysis of soil surrounding the concrete berm has been conducted at this site.

5.8.3 Nature and Extent of Contamination

No historical data were uncovered which related to the nature and extent of contamination.

5.8.4 Conceptual Model

Before construction of the concrete pad (assuming it was not constructed in 1980), any spills would have been directly released to the soil. After construction of the concrete pad and berm, any inadvertent spills or leaks would have been initially confined to the concrete slab. However, the 1.5-in drain pipe on the west side of the concrete berm would have allowed for a release to surface soil. Rain water could have washed spilled oil to surrounding soil through this pipe or by overflow. In addition, wash water containing waste oil generated during steam cleaning of the tank exterior would have flowed through the drain pipe onto surface soil. Containers of waste oil left on the ground near the tank may have spilled or leaked directly onto surface soil.

The primary contaminant source is waste motor oil. Although the tank was designed to contain used motor oil for recycling, there was no control over what people put in the tank. It is possible that other unknown waste was disposed of there.

The volume of motor oil released to the soil during the lifetime of the Waste Oil Tank is unknown, but it is estimated to be a few gallons. Motor oil is a complex mixture of hydrocarbon compounds. Volatile constituents may evaporate or move through the soil in the vapor phase and are expected to move farther from the release site than the larger, heavier hydrocarbon constituents. Heavier hydrocarbon compounds such as those found in motor oil are not expected to migrate rapidly through

the soil from the release. Biodegradation of both light and heavy hydrocarbons may occur but is generally a slow process in arid regions (Mull 1971; Kostecki and Calabrese 1989a, b). Potential contamination should be confined to the surface and shallow subsurface soil. The areal extent of contamination should be limited to the concrete slab and the area immediately surrounding it.

The potential COCs at ER Site 186 pose little direct human exposure risk. Presently, institutional controls prevent occupational or public exposure to the potential COCs. Access to the site is partially controlled by the guards at the KAFB gates. Construction and maintenance of a concrete or asphalt cover would prevent direct exposure to the source. If site maintenance requires disturbing the soil, monitoring will be instituted to ensure worker safety.

Based on the analytical results from the sampling discussed below, the data will be compared to action levels. Assuming the present conceptual model is correct (and the vertical extent of contamination is shallow) and contaminant levels in the soil exceed criteria, the contaminated soil and concrete pad will be excavated and the area backfilled with clean material. Contaminated soil will either be treated onsite or treated or disposed of offsite. If the vertical extent of contamination is greater than anticipated, *in situ* remediation techniques (bioremediation and soil vapor extraction) may be feasible.

Data required to evaluate corrective measures will be collected as described in the Sampling Plan presented below. No additional data are required to evaluate the effectiveness of institutional controls during the RFI/CMS. It is assumed that the data collected in the course of characterizing the nature and extent of the potential release will be sufficient to determine the feasibility of *in situ* remediation techniques or to approve waste for off-site transport and treatment.

5.8.5 Sampling Plan

The investigation proposed in this sampling plan will determine the nature and extent of potential contamination persisting from possible releases associated with the TA-I Waste Oil Tank within the current boundary of ER Site 192. As mentioned above, the absence of historical data means the horizontal and vertical extent of the contaminant releases from the TA-I Waste Oil Tank are not well defined.

General DQOs for the TA-I RFI are given in Section 4.3. Site-specific DQOs for ER Site 192 include:

- Determining if petroleum hydrocarbons and VOCs are present in soils around the concrete pad using a Geoprobe and field screening (Level I).
- Determining if petroleum hydrocarbons and VOCs are present by analyzing samples at on-site and off-site laboratories (Level II and III).
- Characterizing the vertical and horizontal extent of COCs in soil by collecting analytical samples from deep boreholes (Level II and III).

These DQOs will be achieved by analyzing soil samples collected using the strategy described below. If contaminants are detected in the soil samples at concentrations above the action levels, additional samples will be collected. Analytical Levels I, II, and III will be required for analytical procedures under this plan. Data will be collected during Geoprobe surface and shallow subsurface soil sampling and soil boring investigations.

5.8.5.1 Geoprobe Surface and Shallow Subsurface Soil Sampling

5.8.5.1.1. Data Collection

Initially, the Geoprobe surface and shallow subsurface soil sampling (herein referred to as Geoprobe soil sampling) will be performed at the four sampling locations immediately surrounding the concrete pad where the waste oil tank was formerly located (Figure 5-27). If there are detections of COCs at these locations, then the investigation will continue with four additional locations spaced farther out from the concrete pad (Figure 5-27).

Samples will be collected at interval depths of 0 to 2 ft, 3 to 5 ft, 8 to 10 ft, etc., using the hydraulic-driven probe. The Geoprobe soil sampler will be advanced until 2 samples are determined to be clean by means of field screening. Samples will be collected every 5 ft for lithologic logging, field screening (Level I), and laboratory analysis (Level II and III). Initially, the Geoprobe soil sampler will be advanced to 5 ft bgs with split samples collected at 2 and 5 ft. One split from each depth will be sealed, labeled, and held for possible confirmatory laboratory analysis. The other split will be field screened for petroleum hydrocarbons as described below.

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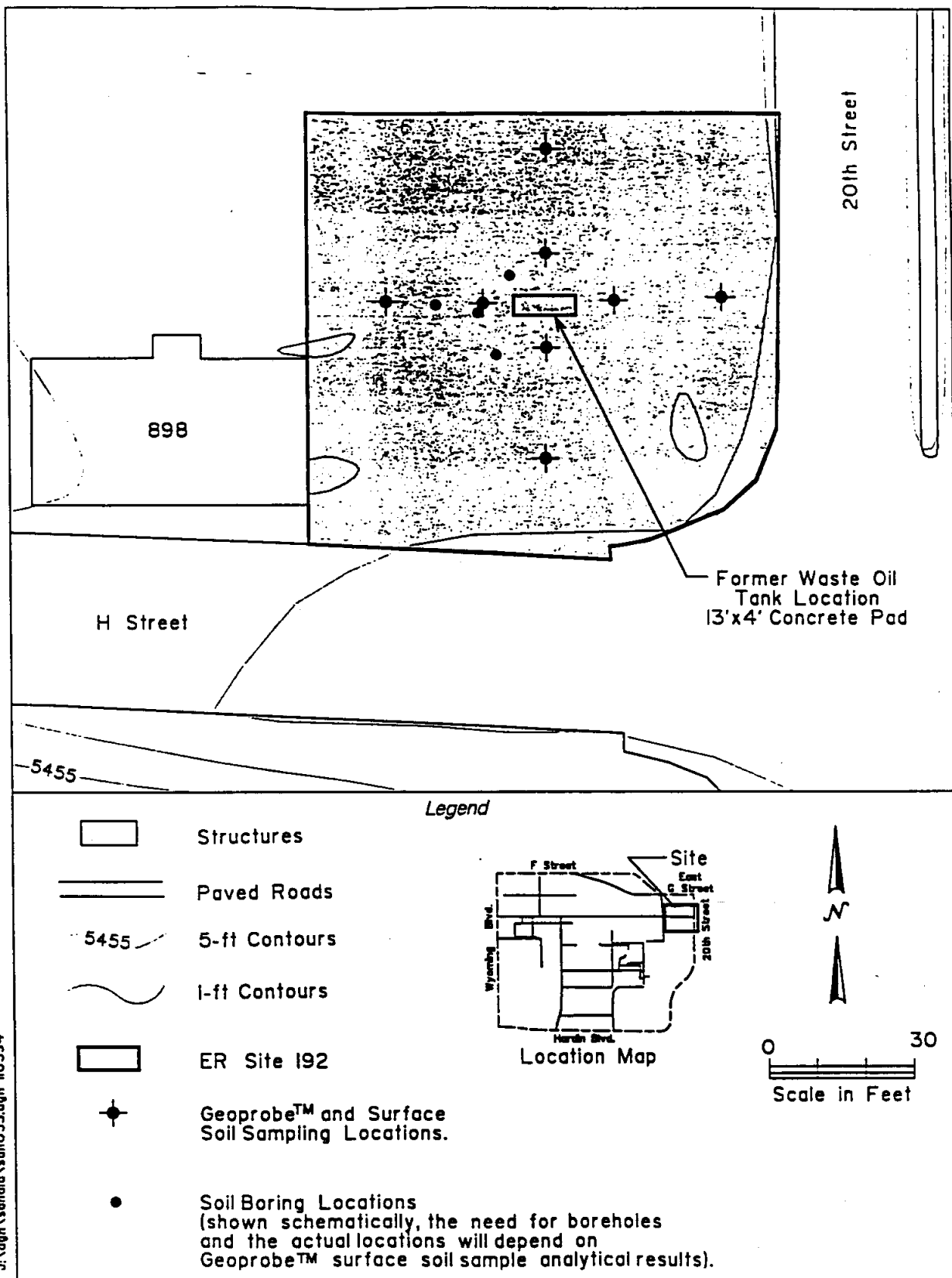


Figure 5-27
ER Site 192: Proposed Sampling Locations

If no petroleum hydrocarbons or VOCs are detected by the field screening, then the 2-ft and 5-ft samples will be considered clean and sent for confirmatory off-site laboratory analysis. If petroleum hydrocarbons or VOCs are detected by field screening in the 2-ft or 5-ft samples, the Geoprobe soil sampler will continue to be advanced and split samples will be collected at 5-ft intervals. Geoprobe soil sampling will continue until two 5-ft depth intervals have negative field screening results, or to the maximum depth capable with the equipment, which is anticipated to be 30 ft. In this case three samples per location will be sent for laboratory analysis: one sample from the depth showing the greatest field screening results (to characterize the nature of the COCs), and one sample from each of the two deepest clean sample intervals (to characterize the vertical extent of COCs).

Surface and shallow subsurface soil sampling by hand auger or power auger may be used to complement the Geoprobe soil sampling. If necessary, samples will be collected with a scoop or hand auger at the same depth intervals (to the extent practical) and analyzed for the same parameters as the Geoprobe soil samples.

5.8.5.1.2. Analytical Parameters

Field screening of the samples collected at the surface and at 5-ft intervals will consist of headspace analysis as described in the NM UST regulations (NMED 1990), or using a more sensitive method such as a petroleum hydrocarbon immunoassay test (a modified SW-846 Method 4030). The appropriate soil samples will be analyzed for TCL VOCs and TPH (Method 418.1 or 8015) by GC/MS at the on-site laboratory (Level II). Split samples of at least 20 percent of the on-site laboratory analyses will go to an off-site contract laboratory for confirmatory analysis (Level III). Table 5-20 lists the analytical parameters, EPA analytical method, analytical level, sample type, sample collection method, sample container, preservative and number of environmental and QA/QC samples.

If field screening indicates gross contamination, then additional samples may be collected to characterize possible degradation of motor oil. A thorough analysis will be conducted on four samples: one that has the highest concentrations based on field screening results, and three samples collected at three deeper 5-ft intervals at the same location. These select samples will be analyzed for TCL VOCs (Method 8240), TCL SVOCs (Method 8270), and TAL inorganics by an off-site laboratory. If there are no positive field screening results, then these analyses will be performed on the samples collected from the 3- to 5-ft depth at the four locations nearest the concrete pad.

5.8.5.2 Borehole Sampling

5.8.5.2.1. Data Collection

It is possible that the Geoprobe soil sampling will not fully characterize the vertical extent of contamination. For planning purposes, it is assumed that the boreholes will be a maximum of 100 ft deep. It is assumed that to characterize the vertical extent of contamination, approximately 400 ft of borehole will be needed. This drilling footage is based on the estimation that 1 cluster of 4 boreholes (each drilled to 100 ft bgs) may be needed. If these assumptions appear to be erroneous as the investigation proceeds, additional boreholes may be drilled. Sampling in any additional boreholes would be similar to that described below.

Locations showing contamination ("hot spots") at the deepest sample interval collected during Geoprobe sampling will require a deep borehole investigation. At those Geoprobe locations where screening and verification sampling do not detect potential COCs, boreholes will not be drilled. Boreholes will be located in groups of up to four boreholes clustered around each hot spot location requiring vertical characterization. One borehole will be placed at the Geoprobe soil sampling hot spot location with sampling starting below the deepest sample interval (most likely 30 ft bgs, based on equipment capabilities). The other boreholes (up to three) will be equally spaced around the central borehole in order to define the vertical and horizontal extent of any contamination. The number of perimeter boreholes and the distance from these boreholes to the central borehole will be based on the concentration of the contaminant and the depth of contamination identified in the central borehole, as well as site clearance/access issues. If multiple adjacent Geoprobe soil sampling locations identify hot spots in the deepest sample interval, surrounding each Geoprobe sampling location with boreholes may be inefficient. In this case, the deep borehole locations may be optimized to characterize the entire group of Geoprobe soil sampling locations.

The deep boreholes will be drilled with a hollow-stem auger until two samples are determined to be clean by means of field screening. Samples will be collected at 5-ft intervals to 50 ft bgs, 10-ft intervals to 100 ft bgs, and 20-ft intervals thereafter for lithologic logging, field screening (Level I), and possibly for laboratory analysis. Initially the borehole will be sampled 5 ft below the deepest Geoprobe sample with split samples collected at two consecutive 5-ft intervals. One split from each depth will be sealed, labeled, and held for possible laboratory analysis. The other split will be screened as described below to determine the presence of petroleum hydrocarbons. If no petroleum

hydrocarbons are detected by the field screening, then those two 5-ft samples will be considered clean and sent for confirmatory off-site laboratory analysis.

If petroleum hydrocarbons are detected by field screening in either or both 5-ft samples, the borehole will continue to be advanced and split samples will be collected at appropriate intervals. Borehole soil sampling will continue until samples from two consecutive depth intervals have negative field screening results, or to the depth limits of the drilling methods. Typically, three samples per location will be sent for laboratory analysis: one sample from the depth showing the greatest field screening results (to characterize the nature of the COCs), and one sample from each of the two deepest clean sample intervals (to characterize the vertical extent of COCs).

5.8.5.2.2. Analytical Parameters

Table 5-20 lists the sampling and analysis requirements for the samples collected at this site. Field screening of the samples collected at 5-ft intervals will consist of headspace analysis as described in the NM UST regulations (NMED 1990), or using a more sensitive method such as a petroleum hydrocarbon immunoassay test (a modified SW-846 Method 4030). The appropriate soil samples will be analyzed for TCL VOCs and TPH (Method 418.1 or 8015) by GC/MS at the on-site laboratory (Level II). Split samples of at least 20 percent of the on-site laboratory analyses will go to an off-site contract laboratory for confirmatory analysis (Level III).

October 13, 2003

ADDITIONAL /SUPPORTING DATA

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